# National Advisory Council for Environmental Policy and Technology

## Charge for Developing Recommendations on U.S. EPA's Sustainable Infrastructure Watershed Pillar

## Background

The EPA Administrator has identified Sustainable Water Infrastructure (hereafter referred to as Sustainable Infrastructure (SI)) as one of the Agency's highest priority initiatives. In January 2003, the Administrator convened a Forum – *Closing the Gap: Innovative Responses for Sustainable Water*. At this Forum, the Assistant Administrator for Water highlighted the "Four Pillars of Sustainable Infrastructure"-- Better Management, Full-Cost Pricing, Water Efficiency, and Watershed Approaches to Protection (hereafter referred as the Watershed Pillar). The SI initiative aims to decrease the gap between growing infrastructure (drinking water plants, piping, etc.) needs and spending, by promoting sustainable infrastructure through the four Pillars.

This charge is being developed to address the challenges specific to the Sustainable Infrastructure (SI) Watershed Pillar. The goal of the Watershed Pillar is to enable utilities (i.e., drinking water and wastewater) and other stakeholders (e.g., local and State agencies, local planning and ordinance organizations, environmental advocacy groups, watershed decision makers) to take advantage of opportunities offered by watershed approaches to minimize infrastructure cost and/or operating and maintenance expenses to achieve water quality and quantity and human health protection goals.

One of the most critical challenges facing the Nation is how to sustain our water and wastewater infrastructure to ensure that the public can continue to enjoy the environmental, health, social, and economic benefits that clean and safe water provide.

Our wastewater and drinking water systems are aging, with some system components older than 100 years. Our growing and shifting population requires investment for new infrastructure and maintenance of existing infrastructure. Current treatment strategies and technologies may not be adequate to address emerging issues, investment in research and development has declined, and the prospects for continued large federal investment are limited.

EPA's *Clean Water and Drinking Water Infrastructure Gap Analysis* (2002) estimated that if capital investment and operations and maintenance remained at current levels, the potential gap in funding between 2000 and 2019 would be approximately $270 billion for wastewater infrastructure and $263 billion for drinking water infrastructure.

Meeting these challenges requires a multi-faceted approach to managing and sustaining our infrastructure assets. The Nation must change the way we manage, view, value, and invest in our water infrastructure. This can only come about if all parties embrace a collaborative approach that encourages new and innovative solutions to the challenges we all face. All levels of government and the private sector have a shared responsibility for seeking effective, efficient, and fair solutions for sustaining our precious water infrastructure.

Through collaboration with all key stakeholders, the use of effective and innovative approaches and technologies, and a commitment to long-term stewardship of our water infrastructure, we can make better use of our resources, potentially reduce the funding gap and move the Nation's water infrastructure down a pathway toward sustainability over the next fifteen years. For example, more than 4,000 local watershed organizations are at work in the United States. They are advocating watershed restoration, source water protection, improved site design, erosion control, land conservation, and storm water management -- to name just a few activities.

The watershed approach is generally invoked to mean broad stakeholder involvement, hydrologically defined boundaries, and coordinated management across all aspects of policy that affect water. "Source water protection" is the watershed approach's analog under the Safe Drinking Water Act. The watershed approach and source water protection are grounded in science and allow for prioritization and cost-effective interventions, as appropriate.

The EPA Office of Water=s 2003 guidance on watershed-based permitting and water quality trading allow for strategic, cost-effective actions to meet water quality standards. Watershed goals and the impact of multiple pollutant sources and stressors, including nonpoint sources, are considered when National Pollutant Discharge Elimination System (NPDES) permits are written for multiple sources in a watershed. The goal of this approach is to issue permits that take into account the conditions of the entire watershed and address diverse pollution sources, not just individual point sources. Often, such permits carry a trading component. A current example of a successful watershed-based permit with trading can be found along Long Island Sound, where nitrogen trading among dozens of publicly owned treatment works in Connecticut is expected to save more than $200 million in control costs.

Source water protection, targeted to protect current and future sources of drinking water, also holds the promise of substantial benefits. EPA has determined that preventing contamination can be up to 40 times more cost effective than remediation of a drinking water source or finding a new one.

Development decisions are another important approach to the watershed paradigm. Development decisions are generally made at the local level. While local governments have direct authority over land use and development decisions, many states play important roles in setting statewide approaches to planning for growth. The EPA cannot and should not be a national or regional development board, but the federal government can help states and municipalities better understand the impacts of development patterns. The Source Water Collaborative's[1] recent Vision Statement notes that drinking water protection should be integrated into land-use planning and stewardship; road, sewer and water projects; farming, industry and development practices; waste disposal methods; watershed planning, protection and clean-up; and the routine decisions Americans make every day. EPA is working to help states and communities realize the economic, community, and environmental benefits of smart growth by: 1) providing information, model programs, and analytical tools to inform communities about growth and development; 2) working to remove federal barriers that may hinder smarter community growth; and 3) creating new resources and incentives for states and communities pursuing smart growth.

[1] The *Source Water Collaborative* consists of a broad set of constituencies that include the U.S. EPA and 13 national premier organizations (representing state agencies, water utilities and environmental groups) that have agreed to combine their efforts to protect drinking water sources.

A key objective the Agency wishes to advance under the sustainable infrastructure effort is the merger of watershed management principles into utility management, so that key decision makers consider the watershed approach alongside the traditional treatment technology investments. As part of this effort, the Agency needs information regarding whether: 1) a bias exists in favor of technological investments due to existing governmental policies, institutional structures, scientific uncertainties, or problems in valuing the benefits of using a watershed approach; and 2) if such a bias exists, how can this bias be eliminated?

The SI now seeks to develop more robust information, data, case studies, and lessons-learned with respect to the use of watershed approaches to avoid or reduce current or future infrastructure costs and/or operating and maintenance expenses. EPA is specifically interested in gathering data on the cost savings and ecological and public health benefits that the use of such an approach may accrue while still achieving compliance with the requirements of the Clean Water Act and Safe Drinking Water Act.

## Charge to the NACEPT Water Infrastructure Workgroup

The Water Infrastructure Workgroup of the National Advisory Council for Environmental Policy and Technology (NACEPT) is asked to assist the Agency in advancing cost-effective and sustainable approaches to water resource management and infrastructure to meet watershed goals. It is the Agency's position that the watershed approach is critical to protecting and restoring the nation's waters. The Agency furthermore suspects that in order for the benefits of the watershed approach to be fully realized it must be integrated into the comprehensive planning processes at the state, regional and local levels.

There are several areas where NACEPT can assist the Agency in determining how to best use its expertise and resources to promote the watershed approach, as it specifically applies to Sustainable Infrastructure, and its integration into state, regional and local comprehensive planning processes.

**Overall Goals:**

A. Promote the development of sustainable infrastructure by elevating water resource and infrastructure protection and management as a state, regional and local government priority in the comprehensive planning process on a par with transportation planning, public safety and schools.

B. Encourage widespread adoption of an integrated planning approach focused on water resource and infrastructure protection and management.

C. Provide information, data, tools and tools necessary for state and local governments and their communities to adopt these approaches.

**Research and Recommendations**

The Charge encompasses two distinct focus areas. Consequently, the Office of Water is proposing that NACEPT adopt a phased approach for addressing the charge over a two-year period.

A. Phase *1: Comprehensive Planning and Decision-Making*

No later than May, 2007 NACEPT would identify incentives, drivers, barriers, and other factors that encourage or inhibit the prioritization of water resource infrastructure and management into the comprehensive state, regional and municipal planning frameworks and decision making processes.

Also no later than May, 2007 NACEPT would provide recommendations to the Agency on:

1. Actions the Agency can take to help states and local governments overcome the barriers and impediments that prevent the full integration of water resource management as a priority in their respective planning and decision making processes. For example:

a. How can the Agency more effectively promote increased collaboration among drinking water, wastewater and storm water utilities, local governments, planning boards and other stakeholders that result in collective water infrastructure priority setting under a watershed management context through education and other means?

b. How can municipalities and other local government/regional planning entities build support for promoting a watershed approach to water infrastructure planning?

c. Using relevant examples from the recent Cooperation Conservation Conference, what are the ways in which “cooperative conservation” or “coordinated resource management” has been or can be used to overcome barriers to promoting a watershed approach to water infrastructure planning?

d. How can EPA, States, or others influence various community stakeholders to adopt and promote such an approach?

e. What are the specific barriers embodied in existing EPA and state policies or practices that need to be remedied to help EPA and states further encourage and assist entities to consider and implement alternative and integrated approaches for water infrastructure planning and management?

B. *Phase 2: Benefits of Traditional versus Alternative Approaches to Water Resource Infrastructure and Management*

No later than May, 2008 NACEPT would identify, analyze and report on the *actual or potential benefits* that accrue to local governments and utilities that use alternative and integrated approaches to manage wastewater, drinking water, and storm water, and the factors that affect whether alternative or traditional approaches are more cost-effective. Examples of these alternative approaches include centralized management of decentralized technologies and systems, soft path technologies, conservation designs, smart growth strategies, water conservation and reuse policies and low impact development approaches.

In doing so, NACEPT would examine specific examples and associated factors from communities where centralized approaches are predominant and those where alternative approaches have been used, along with the key factors that caused these communities to adopt these approaches.

In addition, NACEPT would identify, analyze and report on the *actual or potential incentives* for local governments and utilities to use alternative and integrated approaches to manage wastewater, drinking water, and storm water.

Also no later than May, 2008 NACEPT would provide recommendations to the Agency on:

1. Specific actions (e.g., policy, guidance, technical and programmatic tools, research) that the Agency can take to encourage and promote the investigation of alternative approaches that could meet water quality and service objectives at lower life-cycle cost than traditional approaches. For example, assist EPA in identifying mechanisms for promoting consideration of centralized management and oversight of decentralized systems as a cost-effective alternative to physical consolidation of infrastructure.

**Potential Future Work**

EPA would be open to identifying additional research areas, upon completion of the current charge, to further improve the understanding of sustainable infrastructure issues. The additional research topics may include new areas or may build upon the results of the current research charge.

**ATTACHMENT A**

# Watershed Approach (Long Version)

**What does EPA mean by "a watershed approach"?**

To achieve environmental goals EPA encourages adoption of a watershed approach as a broad coordinating process for focusing on priority water resource problems. Using a watershed approach, multiple stakeholders integrate regional and locally-led activities with local, State, Tribal, and Federal environmental management programs. These environmental goals should ultimately protect and restore the health of the nation's aquatic resources, which includes but goes beyond meeting water quality standards; we must also address (a) pollutants for which there are currently not numeric standards (including nutrients and clean sediments); (b) healthy aquatic habitats (including wetlands); (c) coastal and marine waters; and (d) invasive species and other stressors. Relevant activities in watersheds include use of Clean Water Act and Safe Drinking Water Act authorities, funding and guidance, as well as many other tools that are available through other Federal, State, Tribal and local programs and non-governmental resources.

Major elements of successful watershed approaches involve:

- **focusing on hydrologically-defined areas**--watersheds and aquifers have hydrologic features that converge to a common point of flow; watersheds range in size from the very large, such as the Mississippi River Basin, to a drainage basin for a small creek;

- **using an integrated set of tools and programs** (regulatory and voluntary, Federal/State/Tribal/local and non-governmental sectors; innovation; communication and technical assistance; and sound science and information) to address the myriad problems facing our Nation's water resources, including: nonpoint source and point source pollution, habitat degradation, invasive species, and air deposition of pollutants, like mercury and nutrients;

- **involving all parties having a stake**, or interest, in developing collaborative solutions to a watershed's water resource problems;

- **using an iterative planning or adaptive management process** of assessment, setting environmental and water quality and habitat goals such as water quality standards, planning, implementation, and monitoring and ensuring that plans and implementation actions are revised to reflect new data.

- **breaking down barriers between plan development and implementation** to enhance prospects for success

EPA continues to work with Federal agencies, States, Tribes, local communities, and non-governmental sectors to make a watershed approach the key coordinating framework of our planning, restoration, and protection efforts to achieve "clean and safe" water and healthy aquatic habitat.